Polyploidy and hybridization patterns in the North American bluet genus *Houstonia*

K.L. Glennon[a], S.A. Church[b]
[a]*School of Animal, Plant, and Environmental Sciences, University of the Witwatersrand, Private Bag 3, WITS, Johannesburg 2050, South Africa*
[b]*Department of Biological Sciences, The George Washington University, 2023 G St NW, Washington, D.C., 20052, USA*

Classic speciation models show that interspecific hybridization between diploid lineages is impeded by genetic incompatibilities. Recent models predict that single gene duplications may reduce genetic incompatibilities between species. In the context of these models, whole genome duplication (polyploidy) events would increase the likelihood of successful hybridization between polyploid lineages relative to diploid lineages. We hypothesized that polyploid plant lineages would contain more interspecific hybrid individuals than diploid plant lineages. We tested this hypothesis by using microsatellite data to examine hybridization patterns between species in the North American plant genus, *Houstonia* L. section *Amphiotis*. Our findings show that more hybrid individuals were present in polyploid lineages than in diploid lineages. These results coincide with a trend in the literature that link polyploidy to successful interspecific hybridization in other plant taxa. Future experimental studies are now needed to directly test the relationship between polyploidy and reproductive isolation between species. These studies are important for identifying processes that are responsible for plant diversity.

doi:10.1016/j.sajb.2013.02.060

Sharing the sand-pit: The contribution of human physiology to phytosciences

L.J.C. Erasmus, M.J. Potgieter
Department of Biodiversity, School of Molecular and Life Sciences, University of Limpopo, Private Bag X1106, Sovenga 0727, South Africa

It is well-established, that the phytosciences originated from the multi-disciplinary integration of subjects that have seldom been linked before. It is a diversified field combining socio-economic and political aspects, chemistry, biochemistry, human and animal physiology, microbiology, medicine in general, agriculture and botany. This field of research is quite unique among the more established biomedical sciences in that, instead of focussing on the testing of a hypothesis *per se*; phytoscience researchers attempt to validate the health benefits of traditional medicine and investigate the possible mechanisms of action. It is therefore fair to reason that a key component, to current medicinal plant research endeavours, should include expertise regarding human physiology. A lack of insight, resulting from excluding human physiologists, can limit research deductions; and the application value of research findings. The aim of this study was to establish the contribution of physiology, or any other relevant disciplines, to phytomedicine research in South Africa. Data were collected from peer-reviewed scientific output, focussing specifically on medicinal plant research. Phytosciences, as a multi-disciplinary field of research is almost unlimited; therefore the focus was predominantly on current trends rather than on delivering a comprehensive analysis. Preliminary findings indicate that, within the South African context, human physiologist play a very limited role in this challenging research environment. It is envisaged that incorporating such skills will result in more comprehensive research outputs.

doi:10.1016/j.sajb.2013.02.061

Showcasing some of the technology developed in SANBI

L.W. Powrie
Kirstenbosch Research Centre, South African National Biodiversity Institute, Private Bag X7, Claremont 7735, South Africa

The South African National Biodiversity Institute (SANBI) is responsible for exploring, revealing, celebrating and championing biodiversity for the benefit and enjoyment of all South Africans. We accomplish this by networking our own work and that of other organisations with mandates related to exploring, revealing, celebrating and championing biodiversity. In the process of doing our work we have developed some tools that would be useful in the broader biodiversity sector. These include spell checking dictionaries for use in a word processor, databasing plant traits, making images of specimens searchable online and sophisticated tools for georeferencing of herbarium and museum specimens. The presentation demonstrates a selection of these tools and outlines how other biodiversity practitioners can benefit from them. It also outlines advances with the national vegetation map and national vegetation database.

doi:10.1016/j.sajb.2013.02.062

The effect of n^6-benzyladenine on multiple shoot induction on soybean for subsequent *Agrobacterium*-mediated genetic transformation

P. Mangena, P.W. Mokwala, R.V. Nikolova
Department of Biodiversity (Botany), School of Molecular and Life Sciences, University of Limpopo, Private Bag X1106, Sovenga 0727, South Africa

Genetic transformation in soybean is recalcitrant and depends on suitable explants from which new shoots can be regenerated and be amenable for transformation. Multiple shoot induction on soybean [*Glycine max* (L.) cultivar LS 677] was carried out to improve a regeneration protocol for subsequent *Agrobacterium*-mediated transformation. Multiple shoots were induced on single and double cotynode explants obtained from soybean seedlings germinated on MS medium containing N^6-benzyladenine (BA). Shoots were induced by culturing explants on MS medium containing different concentrations of BA and BA combined with kinetin (KIN). The highest number of shoots was obtained on media containing BA alone. The concentrations of BA that resulted with the highest number of shoots were 1.57 and 2.00 mg/l both with 9 shoots on average, per explant. The induced shoots were elongated on MS medium containing 0.6 mg/l GA_3 and rooted on MS medium without plant growth regulators (PGRs). Rooted plants were hardened in the growth room with 70% success and produced viable seeds.

doi:10.1016/j.sajb.2013.02.063

Assessment of putative imazapyr tolerant sugarcane plants by acetolactate synthase enzyme activity and isolation of the associated mutated gene

K.Z. Maphalala[a,b], A. Koch[a], S.J. Snyman[a,b], R.S. Rutherford[a,b], M.P. Watt[b]
[a]*South African Sugarcane Research Institute, Private Bag X02, Mount Edgecombe 4300, South Africa*
[b]*School of Life Sciences, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa*